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UNITED STATES PATENT APPLICATION

OF

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FOR

~~COMPOSITIONS AND METHODS FOR STIMULATING PANCREATIC ISLET CELL REGENERATION~~

BCB 10/29/03 cmdt B

~ZINS1 POLYPEPTIDE COMPOSITION STIMULATING PANCREATIC ISLET GROWTH

PATENT APPLICATION
96-41

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2INSA POLYPEPTIDE COMPOSITION ^ STIMULATING PANCREATIC ISLET GROWTH

DESCRIPTION

~~Compositions and Methods for Stimulating Pancreatic Islet Cell Regeneration~~

BACKGROUND OF THE INVENTION

β-cells are specialized cells that secrete insulin and are found in pancreatic islets. Insulin belongs to a group of protein/polypeptide hormones. Insulin increases the rate of synthesis of glycogen, fatty acids, and proteins and stimulates glycolysis and cell proliferation. It also promotes the transport of glucose, and some other sugars, and amino acids into muscle and fat cells. Insulin levels are regulated to maintain glycemic homeostasis, and an important mechanism for regulating insulin production, and hence insulin levels, is β-cell mass.

During the lifetime of an individual metabolic needs can change drastically, requiring dynamic changes in cells and tissues that regulate homeostasis. During pregnancy (Marynissen et al., Diabetes 36:883-891, 1987) β-cell mass increases, as well as in response to obesity (Kloppel et al., Surv. Synth. Pathol. Res. 4:110-125, 1985). These increases in β-cell mass are attributed to an increased requirement for insulin to maintain normal glucose levels (Parsons et al., Endocrinology 130:1459-1466, 1992). It has also been shown that β-cell mass normally decreases post-partum, primarily by apoptosis (Scaglia et al., Endocrinology 136:5461-5468, 1995).

It is generally believed that increases in β-cell mass occurs in three ways: 1) an increase in cell size and function; 2) increased proliferation of mature β-cells; and/or 3) increased recruitment and differentiation of β-cell progenitors. In diabetic mice, animals that